

AMENDMENTS TO THE CLAIMS

1. (Cancelled)
2. (Currently Amended) A ~~biochip~~ cartridge according to claim 6, 24 or 26 wherein said capture binding ligands comprise nucleic acids.
3. (Currently Amended) A ~~biochip~~ cartridge according to claim 6, 24 or 26 wherein said reaction chamber further comprises a gasket to retain fluid in contact with said array.
4. (Cancelled)
5. (Previously Presented) A ~~biochip~~ cartridge according to claim 6, 24, or 26 wherein said reaction chamber further comprises an outlet port.
6. (Currently Amended) A ~~biochip~~ cartridge comprising:
 - a) a reaction chamber comprising:
 - i) a substrate comprising an array of electrodes, each comprising:
 - A) a self-assembled monolayer; and
 - B) a capture binding ligand covalently attached to said electrode;
 - ii) an inlet port positioned at the bottom of the reaction chamber for the introduction of reagents;
 - iii) an outlet port positioned at the top of the reaction chamber, ~~to minimize the introduction or retention of air bubbles upon introduction of reagents and~~
 - b) interconnects to allow the electrical connection of said electrodes to a processor.
7. (Currently Amended) A ~~biochip~~ cartridge according to claim 6, 24, or 26 wherein said array is on one surface of said substrate.

8. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26 wherein two surfaces of said substrate each comprise an array.

9. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26 further comprising a cap comprising at least one storage well comprising assay reagents.

Claims 10-23. Cancelled.

24. (Currently Amended) A biochip cartridge comprising:

- a) a reaction chamber comprising:
 - i) a substrate comprising a printed circuit board comprising an array of electrodes, each electrode comprising:
 - A) a self-assembled monolayer; and
 - B) a capture binding ligand covalently attached to said electrode;
 - ii) an inlet port for the introduction of reagents; and
- b) interconnects to allow the electrical connection of said electrodes to a processor.

25. (Currently Amended) A biochip cartridge according to claim 6 or 24, wherein said ~~outlet~~ inlet port comprises a semipermeable membrane filter.

26. (Currently Amended) A biochip cartridge comprising:

- a) a reaction chamber comprising:
 - i) a substrate comprising an array of electrodes, each electrode comprising:
 - A) a self-assembled monolayer; and
 - B) a capture binding ligand covalently attached to said electrode;
 - ii) an inlet port for the introduction of reagents, said inlet ~~outlet~~ port comprising a semipermeable membrane filter; and

b) interconnects to allow the electrical connection of said electrodes to a processor.

27. (Canceled)

28. (Currently Amended) A biochip cartridge according to claim 26, wherein said semipermeable membrane comprises polytetrafluoroethylene.

29. (Currently Amended) A biochip cartridge according to claim 26, wherein said semipermeable membrane comprises expanded-polytetrafluoroethylene.

30. (Currently Amended) A biochip cartridge according to claim 6 or 26 wherein said substrate comprises a printed circuit board.

31. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26, wherein said capture binding ligands comprise proteins.

32. (Previously Presented) A cartridge according to claim 6, wherein the inlet port and the outlet port are separated.

33. (Previously Presented) A cartridge according to claim 6, wherein the inlet port connects to the outlet port.

34. (Previously Presented) A cartridge according to claim 9, wherein the cap is removable.

35. (Withdrawn) A method for filling a reaction chamber comprising:
providing a cartridge comprising a reaction chamber, an inlet port positioned at the bottom of the reaction chamber, and an outlet port positioned at the top of the reaction chamber;

introducing a fluid into the inlet port positioned at the bottom of the reaction chamber;

allowing escape of gas through the outlet port at the top of the reaction chamber, thereby filling the reaction chamber without introducing a bubble into the reaction chamber.

36. (Currently Amended) A biochip cartridge according to claim 24, wherein at least one of the electrodes is on a surface of the printed circuit board.

37. (Currently Amended) A biochip cartridge according to claim 24, wherein at least one of the electrodes is fabricated on the printed circuit board.

38. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26, wherein further comprising an assay complex ~~is formed~~ on at least one of said electrodes, ~~[[the]]~~ said assay complex comprising at least one of said capture binding ligands, a target analyte, and an electron transfer moiety.

39. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26, wherein the self-assembled monolayer comprises a conductive oligomer.

40. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26, wherein at least one of the electrodes comprises gold.

41. (Currently Amended) A biochip cartridge according to claim 6, 24, or 26, wherein the self-assembled monolayer comprises a thiol-containing monolayer forming species.